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Comments on revised guidelines attached.

May 14, 2007

I am research scientist specializing in the inventory and monitoring of bats. My comments are as much in response to the Revised Guidelines themselves as they are to my reading of the transcript of the April 16, 2007 workshop, which I did not attend. My comments also apply solely to sections in these documents that address bats.

Several of the participants at the April 16, 2007 workshop criticized the Revised Guidelines because of what was characterized as its "too rigid", "one-size-fits all" or "cookie-cutter" recommendations with respect to monitoring. Additionally there were concerns that recommendations in the guidelines were "costly" and "excessive" and had the effect of turning the monitoring of each facility into a research project. This was characterized as an undue burden on developers.

On the face of it, I agree that a "one-size-fits-all" approach to monitoring is neither necessary nor useful. In post-construction monitoring, for instance, a recommendation to conduct carcass searches at 100% of turbines means something entirely different for a facility with 3 turbines versus one with 300 turbines. However, **I believe that some standardized minimum level of effort during the pre-construction and operations period is necessary.** A case in point is a recent review of 127 studies on the impacts of wind farms on birds and bats in Europe (Hötker et al. 2006). One of the primary laments of these authors was that because of differences in study methods and durations, it was difficult to draw robust conclusions regarding potential impacts (Hötker et al. 2006, p. 8). Nearly all of the speakers at the April 16, 2007 hearing expressed their desire to understand and avoid impacts to bats and birds. It is only through standardized methods, applied at multiple locations, that we will be able to achieve these goals.

Several participants at the April 16, 2007 hearing suggested that the need for monitoring every project might be avoided if intensive, "research-type" monitoring was applied at a few sites. I agree in principle with these suggestions. It is probably not feasible, nor cost-effective, to apply the most rigorous Before-After-Control-Impact (BACI) studies to each and every facility or re-power. Nevertheless there is a need to conduct intensive studies in California because it provides the greatest level of inference (Hötker et al. 2006) and applicability of results from other states is unknown. However, a mechanism is needed by which to extrapolate results from intensively monitored sites to sites that are monitored less intensively.

The ideal solution is to conduct standardized, minimum level of pre-construction and operations monitoring at every site while a minority of sites are monitored more intensively and used to answer basic research questions. Intensively monitored sites could be used to calibrate results from sites that are monitored less intensively. If such an approach is used, stakeholders must agree, up front, as to how to apply correction factors from intensively monitored sites to a particular project.

It is imperative that EACH site receives at least the standardized minimum level of effort both during pre-construction and operations. **Minimum standards must include activity monitoring for 1 year and post-construction fatality monitoring for 2 years. Fatality monitoring should include daily searches of at least some of the turbines.** This is necessary to link fatalities to weather conditions and to provide on-site calibration for longer search intervals. Additionally, the data from these monitoring efforts must be made available to research entities for the purpose of understanding general patterns among facilities and, ideally, for suggesting mitigations if impacts turn out to be high.

The guidelines should **clarify that the reason for activity monitoring of bats during operations is to determine if bat activity levels change in response to turbine construction or operation.** If activity levels do change then it may be that pre-construction activity may be of little use for predicting risk to bats. This relationship can only be understood if multiple sites are monitored during both pre-construction and operation, as the relationships may differ from site to site. The argument has been presented that pre-construction monitoring has not been demonstrated to predict impacts to bats and therefore it should not be required. First of all, I agree that there is not a strong link between pre-construction monitoring and bat mortality. That is because the necessary studies (Arnett et al. 2006, Redell et al. 2006) have only recently begun and have only monitored the pre-construction phase. One outcome of these, and other, studies may very well be that there is not a strong link between the two. However, this can only be determined via research. I understand concerns about turning the monitoring of each project into a research effort and do not think it is necessary to do so from a scientific standpoint. We do need to develop a reasonably large sample of facilities where pre-construction monitoring results can be linked to mortality results during operations. However it is important that such work is done well, which may be costly for individual sites. The Revised Guidelines seem to imply that California endeavors to create such a data set by requiring monitoring during both pre-construction and operations at each facility. If this is one of the goals of the Revised Guidelines, and it would be a laudable one, then it should be stated explicitly in the document. Another alternative, for those who find such requirements overly onerous is to create a mechanism whereby a proponents could deposit a requisite amount of monitoring funds that could be used by the state to encourage intensive research-type monitoring at a smaller number of facilities.

I understand the Guidelines to be recommendations to local entities for setting permit conditions. It may be useful for CEC and CDFG to **spell out a number of additional monitoring activities, in addition to minimum levels of monitoring,** that would help generate important new information and ease local concerns. Such alternative could include:

- Mortality monitoring that continues for > 2 years
- Mortality monitoring at longer, regular intervals (e.g., every 5 years) for the life of the project.
- Activity monitoring, linked to weather conditions, during operations.
- Allowing access to facilities for research

- Financial contributions to a state-wide pool of research funds.

Re-powering. There have been suggestions that permit requirements for re-powers should be eased because available information suggests that impacts are lower for raptors. However recent, preliminary information suggests that the impacts may actually be greater for bats (Barclay et al. 2007). I encourage CEC and CDFG to consider the information presented in this paper. Further it is important to acknowledge the rapid pace with which new information on impacts to bats from wind energy facilities, and its variability, is being generated and to construct guidelines that account for this.

Finally it is imperative that a section on change management is included in the guidelines. This would describe when the guidelines will be reviewed and the process under which they would be changed. For instance, due to a lack of understanding regarding seasonal activity patterns of bats in California, 1 year of pre-construction monitoring is required. However after several years of monitoring and research we may determine that pre-construction monitoring is not a useful predictor of risk, or that risk is best predicted by monitoring during fall migration periods. In such cases, a year of pre-construction monitoring would serve no useful purpose and could be eliminated. If process for change is not incorporated now, it is not clear how such requirements would be relaxed.

Sincerely,

Ted Weller

Literature Cited

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Hötker, H., K-M Thomsen, and H. Jeromin. 2006. Impacts on biodiversity of exploitation of renewable energy sources: the example of bats and birds – facts, gaps in knowledge, demands for further research, and ornithological guidelines for the development of renewable energy exploitation. Michael-Otto-Institut im NABU, Bergenhusen. Accessed 5/14/07: http://www.lpo.fr/etudes/eolien/doc/englische20windkraftstudie.pdf

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